

university. The hospital should be a school only in the sense of being a school of applied science where general principles of science are applied to a specific technical purpose. But if the medical student is to be no longer provided with instruction in scientific fundamentals at the hospitals, there must be forthcoming—if London is to remain a great medical and surgical centre—funds enough to provide other institutions where this teaching may be given. University College and King's College have long done work of this kind, but the accommodation which they are able to provide is quite inadequate for the instruction of the students of all the hospitals, and other colleges are required where general education of a university standard may be obtained.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 26.—“On the Comparison of the Platinum Scale of Temperature with the Normal Scale at Temperatures between 444° and -190° C., with Notes on Constant Temperatures below the Melting-point of Ice.” By Prof. Morris W. **Travers**, F.R.S., and A. G. C. **Gwyer**.

The authors conclude that, as might be expected, it is possible to apply the parabolic formula of Callendar and Griffiths to the re-calculation of the differences between the platinum scale of temperature and the scale of the gas thermometer, though the range through which it is applicable, and value of the constant δ , precludes the possibility of employing it except for interpolation. A standard scale of temperature, based on Callendar's three fixed points, using standard wire, and taking 1.5 for the value of δ , would lead to absurd results at low temperatures; and the converse may be said of the authors' own observations. The results referred to in this paper may be summed up as follows:—

Nature of gas thermometer.	Observer.	δ
Constant pressure air (0° to 444°)	Callendar and Griffiths	1.50
Constant volume nitrogen (-23° to 445°)	Chappuis and Harker	1.54
Constant volume nitrogen standardised by constant pressure air at 444° (500° to 1000°)	Harker	$1.51-1.49$
Constant volume hydrogen (-190° to 34°)	Travers and Gwyer	1.90

February 2.—“On the ‘Blaze-currents’ of the Gall Bladder of the Frog.” By Alice M. **Waller**. Communicated by Dr. Augustus D. Waller, F.R.S. (From the Physiological Research Laboratory of the University of London.)

This investigation was made in continuation of Dr. Waller's work on blaze-currents. A blaze-current, as defined by Dr. Waller in previous communications to the Royal Society and in his lectures on the signs of life, is a current of action, an electric current aroused in living tissues by stimulus; the term “blaze” has reference to the vitality of the tissue, to a chemical exchange going on within it; a muscle at rest is smouldering, a muscle in action is blazing. Dr. Waller's apparatus and method of work were employed; the apparatus consists essentially of a keyboard containing four keys, opening respectively to an induction coil, a compensator, the object to be studied, and a galvanometer or electrometer. Any accidental current in the object is compensated so that the galvanometer key can be opened without altering the zero, then the object is stimulated by a single break induction shock, the galvanometer key is opened, and the after-effect observed.

As seen in previous work by this method, the direction of blaze-current varies in different living objects or tissues, e.g. in a plant the blaze-current is either post-anodic or homodrome or it runs from younger to older tissue, in the crystalline lens from anterior to posterior surface, in skin from within outwards. The tissues and organs of the frog were systematically examined, and it was found that the liver gave responses either antidrome or from surface to hilum, and the gall bladder gave surprisingly large electrical variations, as much as $1/10$ volt, always antidrome, in a way that one is accustomed to regard as due to polarisation currents in non-living matter. These polarisation currents were proved to be physiological by their abolition on submitting the organ to strong chloroform, boiling or electrocution by tetanisation. The effect is local, it can be destroyed by tetanus at

two spots, and was found to persist at other parts of the round bladder.

Employing Waller's A. B. C. method, in which a three-way switch is employed so that the anode and cathode of the exciting current can be separately interrogated, it is found that the blaze at each pole is post-kathodic or antidrome. The blaze lasts about two minutes; it is often diphasic or triphasic; a single break shock with coil at 5000—(Berne scale) gave $+0.0125$ volt, then -0.0110 , then $+0.010$.

The bladder was washed out and filled with salt solution, and the same effect obtained; a piece was snipped off and electrodes applied to mucous and serous surfaces, and still antidrome blaze obtained, though there was a tendency to exhibit the usual mucous to serous blaze.

The simplicity of structure of the gall bladder—a sphere having a single row of columnar epithelium on the mucous interior surrounded by layers of smooth muscle fibre cells—may account for the large and definite blaze-currents obtained, but why the cells should exhibit negative polarisation, antidrome rather than homodrome or positive polarisation, is not yet apparent.

Entomological Society, February 1.—Mr. F. Merrifield, president, in the chair.—*Exhibitions*:—Specimens of *Oligota granaria* found in a granary at Holborn, the only other localities reported hitherto being Shoe Lane, London, and Scarborough: H. St. J. **Donisthorpe**.—An Erycinid butterfly *Mesosemia cumene* pinned in its natural position of rest to show its resemblance to the head of a small mammal, such as a mouse: W. J. **Kaye**.—A variety of the female of *Lycena melanops* named by him var. *wheeleri*: Dr. T. A. **Chapman**. As a mere aberration it was interesting, but it was of value as showing that the position in the genus for long accorded to the species, whether by accident or design, close to the Arion-Euphemus group, was correct. The considerable extension of the blue in this specimen showed up certain black spots on the upper surface of both upper and lower wings, strictly similar to these characteristics of the Arion-Euphemus group.—A living ♀ *H. defoliaria*, taken as late as February 1, at rest on north side of oak-tree, and another ♀ taken January 28 in the same wood at Bexley. A ♂ *Notodonta ziczac* × ♀ *N. dromedarius*, with two hybrids, the colour of the hybrids being that of *dromedarius*, while the markings were those of *ziczac*: F. **Enock**.—A living specimen of *Acridium aegyptium*, L., found in a cauliflower in Bloomsbury, and probably imported from Italy: O. E. **Janson**.—Two specimens of *Malachius barnvillei*, Puton, captured by Mr. Thouless at Hunstanton, Norfolk, in June, 1899, a recent addition to the British list: G. C. **Champion**.—♂ and ♀ specimens of *Machimus rusticus*, Mg., a rare Asilid, taken in cop. at Freshwater, Isle of Wight, on August 13, 1903: H. W. **Andrews**.—A ♀ example of *Panorpa cognata* taken at Byfleet Canal on August 23, 1904: W. J. **Lucas**. The insect occurs at Folkestone, and is said to be found in the New Forest. It is a little difficult at times to identify the ♀ alone, but Mr. K. J. Morton also had identified the specimen exhibited as *P. cognata*. For comparison he also exhibited ♀♀ of *P. communis* and *P. germanica*.—*Papers*:—A revision of the genus *Criocephalus*, with notes on the habits of *Asemum striatum* and *Criocephalus ferus*: Dr. D. **Sharp**, F.R.S., and T. G. **Smith**.—Another entomological excursion to Spain (with descriptions of two new species of Hemiptera by Dr. O. M. **Reuter**): Dr. T. A. **Chapman** and G. C. **Champion**.—On the matrivoorous habit of the species of *Heterogynis*, Ramb., and on the pupal suspension of *Thaumia*: Dr. T. A. **Chapman**.—Notes on New Zealand Lepidoptera: E. **Meekick**, F.R.S.

Zoological Society, February 7.—Mr. Howard Saunders, vice-president, in the chair.—A second collection of fishes made by Mr. S. L. Hinde in the Kenya District of East Africa: G. A. **Boulenger**, F.R.S. Examples of five species were contained in the collection, three of which were new to science.—On some points in the anatomy of a theriodont reptile: Dr. R. **Broom**.—Field-notes on the mammals of Southern Cameroons and the Benito: G. L. **Bates**.—A collection of Heterocera from the Fiji Islands: G. T. **Bethune-Baker**. Of the species enumerated eleven were new to science.—A contribution to the knowledge of

the arteries of the brain in the class Aves: F. E. **Eddard**, F.R.S.—The function of the antennæ in insects: M. **Yearsley**. After reviewing the literature on the subject the author pointed out that Lowne, in his work on the blowfly, suggested that the antennæ were probably balancing rather than auditory organs. Lord Avebury and Latreille were cited in favour of this view, and the work of Yves Delage on Crustacea and of Clemens upon a moth (*Samia cecropia*) as confirmatory experiments. The author then gave details of experiments upon thirty wasps (*Vespa vulgaris*) in which the antennæ had been removed. The results of this mutilation were:—(1) Loss of power of flight; (2) loss of sense of direction; (3) noticeable slowness in all movements. The conclusion arrived at was that in wasps, the antennæ were equilibrating in function. This supported Lowne's surmise and corroborated the experiments of Clemens on *Samia cecropia*.

Anthropological Institute, February 14.—Prof. W. Gowland, president, in the chair.—Exhibition of native dances and ceremonies from the Torres Straits: Dr. A. C. **Haddon**, F.R.S. The exhibition was illustrated by lantern slides and kinematograph films, and dealt with the "Malu" ceremony, secular dances, and fire-making by a rotary method. Dr. C. S. Myers sang several of the native songs, which are sung at the dances, and accompanied himself on a native drum.—Dog-motive in Bornean design: E. B. **Haddon**. The methods of tattooing are constant among the tribes of Borneo, and most of the patterns are derived from the Kenyah and Kayan tribes. The different patterns are all derived from the dog-motive. The rosette pattern, for instance, which is tattooed on the shoulders of the men, is directly derived from the eye of a dog, although the Iban tribe, who have adopted the pattern, call it by the name of various fruits and flowers. The conventional tattoo pattern found on the firearms of Kenyah and Kayan men in Sarawak, although modified out of all recognition, is also clearly derived from the same source, as it is named *asu*, which means dog; from this same pattern a series can be traced to the Iban pattern, which is said to represent a scorpion, *Kala*, but was clearly originally a dog. Similarly the so-called prawn pattern, *Udang*, was shown to be derived from the dog-motive.

Royal Meteorological Society, February 15.—Mr. R. Bentley, president, in the chair.—Report on the phenological observations for the year 1904: E. **Mawley**. The weather of the phenological year ending with November, 1904, was chiefly remarkable for the persistent rains in January and February, the absence of keen frosts in May, the long continuance of hot and dry weather in July, and the small rainfall during the autumn. Throughout the year wild plants came into flower behind their usual dates, but at no period were the departures from the average exceptional. Such spring migrants as the swallow, cuckoo, and nightingale made their appearance in this country at as nearly as possible their usual time. The yield of wheat per acre was the smallest since 1895, while those of barley, beans, and peas were also deficient. On the other hand, there were good crops of oats, potatoes, and mangles. The best farm crops of the year were, however, those of hay, swedes, and turnips. Both corn and hay were harvested in excellent condition. Apples were everywhere abundant, and all the small fruits yielded well, especially strawberries, but there was only a moderate supply of pears and plums.—Observations of meteorological elements made during a balloon ascent at Berlin on September 1, 1904: Dr. H. **Elias** and J. H. **Field**.—The winds of East London, Cape Colony: J. R. **Sutton**.

Linnean Society, February 16.—Prof. S. H. Vines, F.R.S., vice-president, in the chair.—A revised classification of roses: J. G. **Baker**, F.R.S. The author dealt with the genus by dividing it into three groups. In the first group primary species were enumerated; in the second, sub-species and varieties; in the third, the principal hybrids. The primary species as estimated by the author are sixty-nine in number, and they are classified under eleven groups. The geographical distribution can be very briefly stated as follows:—Five species are found south of the Tropic of Cancer in elevated situations, two in Abyssinia, one in the Neilgherries, and two in Mexico. There are six geographical

regions in the North Temperate Zone, each with a considerable proportion of endemic species. (1) Europe, with twenty-nine species; (2) Northern Asia with China and Japan, twenty-six species; (3) Western Asia, with eighteen species; (4) India, with nine species; (5) Western North America with the Rocky Mountains, with ten species; (6) Eastern North America, six species.—The botany of the Anglo-German Uganda Boundary Commission—Polypetalæ, E. G. **Baker**; Gamopetalæ excl. Convolvulaceæ, S. **Moore**; Convolvulaceæ, Apetalæ, and Monocotyledons, Dr. A. B. **Rendle**. The Commission commenced demarcating the boundary in the Uganda Protectorate in December, 1902, H.M. Commissioner on the British side being Lieut.-Col. Delmé-Radcliffe. The collections which are the subject of this paper were made by Dr. A. G. Bagshawe, the medical officer. They contain a considerable number (some fifty) of novelties, as also of known plants not hitherto recorded from the Uganda Protectorate. For the Angolan plant previously known as *Asystasia africana*, C. B. Clarke, which also is in the collection, a new genus, *Styasasia*, is proposed. A considerable percentage of West African coast-plants is a feature of the Protectorate flora as now made known, and worthy of mention is the presence of a small South Afr. an element.

CAMBRIDGE.

Philosophical Society, January 30.—Prof. Marshall Ward, F.R.S., president, in the chair.—On the non-electrification of γ rays; Prof. **Thomson**, F.R.S. Experiments were described in which the electrifications imparted to two equal cylinders made of thin brass, one of them hollow and the other filled with lead, were measured. The cylinders were in electrical connection and were symmetrically placed in a large vessel from which the air was exhausted. The cylinders were exposed alternately to the γ rays of radium, and from the measurement of the charges received by them it was concluded that the electrifications observed when γ rays fall on a body are not due to a charge on the γ rays, but to the charge carried by secondary β rays excited by the γ rays when they fall on the body or on the walls of the vessel containing it.—Are metals made radio-active by the influence of radium radiation? Prof. **Thomson**, F.R.S. From experiments made on lead, brass, and tin it was shown that these bodies, after exposure to radium radiation, exhibit no trace of radioactivity four minutes after the radiation has ceased to fall upon them; there was no evidence of induced activity of any kind, but the method used was not adapted for testing the existence of a very short-lived radio-activity; this has been done by Prof. Bumstead by a method described in the next paper.—Are metals made radio-active by the influence of radium radiation? Prof. **Bumstead**. The experiments described formed a continuation of those reported by Prof. Thomson, and were designed to ascertain whether the secondary rays given out by a surface exposed to the β and γ rays of radium persisted for a very short time after the exposure to the exciting rays had ceased. A rotating disc was used and four substances were tested, viz. copper, lead, tin, and blotting-paper which had been soaked in a solution of uranium nitrate and then dried. The interval between exposure to the rays from 30 mg. of pure radium bromide and the subsequent test for residual activity was less than 0.009 second; and no rays capable of penetrating 7 mm. of air and 0.00005 cm. of aluminium were detected. If any were present they must have been considerably less intense than those given out by a layer of potassium uranium sulphate with a surface-density of one milligram per square centimetre.—Note on the positive leak from hot platinum in air: O. W. **Richardson**. Experiments showing that the rate of discharge of positive electricity by a platinum wire, which had been heated in air long enough for the current to become steady, consists of two parts, one proportional to, and the other independent of, the pressure.—Some methods of increasing the spark length of the Wimshurst machine: B. J. **Palmer**.

February 13.—Prof. Marshall Ward, president, in the chair.—Orthogonal and other special systems of invariants, part i.: Major P. A. **MacMahon**, F.R.S. In this paper orthogonal concomitants are discussed by means of a symbolic calculus with imaginary umbræ. For a binary quantic of any given order, the author finds an inferior limit to the maximum degree of an irreducible covariant of given order

belonging to it: a superior limit is also found in certain cases. For the first three degrees of the concomitants, for a quantic of any order, the actual number of irreducible concomitants is found; and hence the number of fundamental syzygies is inferred. Tables of ground-forms are given for quantics of order 2, 3, 4, 5, 6 respectively.—Reduction of generating functions by means of complex integration: G. B. Mathews, F.R.S. It is shown in this note how a class of generating functions which occur in the theory of invariants, and in that of the partition of numbers, may be reduced by means of Cauchy's calculus of residues.

DUBLIN.

Royal Irish Academy, February 13.—Prof. R. Atkinson, president, in the chair.—Verb functions or explicit operations, with notes on the solution of equations by operative division: Major Ronald Ross, C.B., F.R.S. If any expression is being considered as the result of an operation performed on one of its elements, the actual operation can be separately and explicitly represented in the following manner. The place occupied by the subject-element is called the base of the operation and is always denoted by β . Thus, $\beta \cos^{-1}\beta$ is the operation performed on x in order to produce the function $x \cos^{-1}x$. As β has no quantitative value, such an expression as $\beta \cos^{-1}\beta$ denotes, not a quantity, but an action, and may be called a *verb function*. Before applying such an expression to a subject it must be placed in special (square) brackets in order to distinguish operation from multiplication. The method may be applied to the solution of a complete equation of the n th degree in $2n$ ways, and applies equally to the solution of linear differential equations.

EDINBURGH.

Royal Society, February 6—Dr. Traquair in the chair.—On Penella, a Crustacean parasitic on the Finner Whale (*Balaenoptera musculus*): Sir William Turner. This copepod was originally recognised by Koven and Danielssen as parasitic on *Balaenoptera rostrata*. The author's specimens were obtained in 1903 from *B. musculus*. The memoir comprised an account of the external characters and internal anatomy of the female, which, being from 10 to 12 inches long, varying in different specimens, is a giant amongst copepods. A comparison of the species with other species of Penella was made, and the great length of the thoracic in comparison with the genito-abdominal segment was referred to. The male of this species has not yet been recognised.—The ontogeny of the neuron in vertebrates; a cytological study of the embryonic nucleus: Dr. John Cameron. The results of the investigation tend to show that the so-called neuroblasts of the central nervous system in the early vertebrate embryo are really nuclei, from which the rudiments of the axis cylinder are formed as delicate protrusions. The neuroblast nuclei are found to exhibit remarkable structural changes, as evidence of the formation of these processes. The results attained in this research support the central theory of nerve-genesis as formulated by, among others, His and von Kölliker. They also tend to throw fresh light on the properties and functions of the cell-nucleus.

MANCHESTER.

Literary and Philosophical Society, February 7.—Prof. H. B. Dixon, F.R.S., vice-president, in the chair.—A new direct-vision spectroscope: T. Thorp. In Mr. Thorp's instrument the dispersion is effected by means of a transparent grating of about 14,500 lines to the inch, mounted on the long face of a light crown prism having a refracting angle of about 37° to secure direct vision. This prism-grating is mounted in a hinged frame and adjusted so that the grating face is at an angle of 45° with the axis of the instrument when the frame is at the centre of its range of motion. A spring holds the frame tightly against the end of a micrometer screw having a graduated head, this head being in the focus of a lens placed near the ocular of the spectroscope so that it can be read off without taking the instrument away from the eye. The D lines can just be separated in the pocket instrument, and readings can be made by taking the mean of several to about one Ångstrom unit.—Leaden weights found at Melandra Castle, an old Roman edifice near Glossop, among them

being the uncia, or ounce, and other weights related thereto: F. A. Bruton.—A direct determination of the atomic weight of chlorine by burning a known weight of hydrogen in a known weight of chlorine: Prof. H. B. Dixon, F.R.S., and E. C. Edgar. The hydrogen was occluded in palladium and so weighed; the chlorine was prepared by the electrolysis of silver chloride, and was weighed in the liquid state. The atomic weight comes out about 35.192, higher than the accepted number by 0.012. This higher value is of interest in view of the recent (unpublished) work of Prof. Theodore Richards, of Harvard, who obtains a value 0.019 higher than the accepted atomic weight.—On the occurrence in Britain of the Pacific eider (*Somateria v-nigrum*, Gray), a species new to the European avifauna: C. Oldham.—Some habits of bats, with special reference to the lesser horse-shoe bat (*Rhinolophus hippocrepis*): C. Oldham. Proofs were given that the hibernation of these animals is not continuous, but interrupted by transient periods of activity.

PARIS.

Academy of Sciences, February 20.—M. Troost in the chair.—Observation of the partial eclipse of the moon on February 19: G. Bigourdan. Owing to the cloudy condition of the sky no observations were possible before 7.50 p.m.—On a new method of synthesis of alkyl derivatives of certain cyclic saturated alcohols: A. Haller and F. March. The sodium derivatives of propyl, isobutyl, and isoamyl alcohols, heated to 200° to 225° C. in an autoclave with β -methylcyclohexanone, act partly as reducing and partly as alkyl substituting agents. Homologues and isomers of menthol result from the reaction.—On the examples of Palinuridae and Eryonidae collected in the eastern Atlantic by the French and Monaco expeditions: E. L. Bouvier. The study of the collections brought home by the two expeditions has resulted in the discovery of some new interesting species, among others two types belonging to the genera Puer and Eryonicus, examples of which are extremely rare. These two forms show their distinctive morphological characters very early.—The application to the nitriles of the method of direct hydrogenation by catalysis; the synthesis of primary, secondary, and tertiary amines: Paul Sabatier and J. B. Senderens (see p. 423).—The large solar spot of February, 1905: Th. Moureaux. On February 2 this spot, which was clearly visible to the naked eye, had a length of 180,200 kilometres. Its area was $1/29$ th of the solar disc, and hence it is greater than any sun-spot previously observed.—On Taylor's series on the circle of convergence: Paul Dienes.—On differential equations of the second order containing a single parameter: G. Txizteica.—On the approximate integration of differential equations: Emile Cotton.—On the mode of working of the differential gear of automobiles: A. Petot.—On the coefficient of magnetisation of bismuth and on some fixed points in the diamagnetic scale: Georges Meslin. The coefficient found for mercury was $-0.185 \cdot 10^{-6}$, taking water as $-0.79 \cdot 10^{-6}$. For crystallised bismuth the value, with the additive correction for the air, was $-1.39 \cdot 10^{-6}$, whilst a slightly higher result, $-1.42 \cdot 10^{-6}$, was obtained for the fused metal.—On the perborates: P. Melikoff. A claim for priority as against M. Jaubert.—On lactyllactylactic acid and the dilactide of the inactive acid: E. Jungfleisch and M. Godchot.—On the carbimide of natural leucine: MM. Hugounenq and Morel. The leucine ethyl ester was heated to 130° C. with carbonyl chloride in toluene solution, and the mixture submitted to fractional distillation *in vacuo*. The carbimide sought for was readily separated in this way from the substituted urea formed at the same time.—On the perborates: J. Bruhat and H. Dubois. A description of the preparation and properties of the perborates of potassium, sodium, and ammonium.—Assimilation outside the organism: Ch. Bernhard. It has been stated by Friedel and confirmed by Macchiati that the enzyme extracted from leaves by glycerine in the presence of chlorophyll and light was capable of decomposing carbonic acid and setting free oxygen. The author has not been able to obtain any trace of oxygen under these conditions, and on repeating an experiment exactly in accordance with Macchiati's instructions found that the gas evolved consisted of methane and other inflammable gases, arising from the anaërobic decomposition of the plant tissue, this change not taking place

in the presence of antiseptics, such as camphor. The author therefore regards the decomposition of carbonic acid outside the plant as unproven.—On the composition of brandy from wine: X. Rocques. A table is given showing the results of analysis of twenty-two samples of brandy arising from the distillation of wine, and it is pointed out that a brandy containing a relatively small amount of esters contains an increased amount of higher alcohols.—The prediction of a chemical reaction forming a monovariant system: Camille Matignon.—On two plants producing rubber: E. de Wildeman. A description of two plants, *Bassea gracillima* and *Periploca nigrescens*, the rubber producing properties of which have not hitherto been recognised.—On a new coffee plant in Central Africa: Aug. Chevalier. A detailed account of *Coffea excelsa*, with analyses of the soil in which it flourishes and of the coffee-bean produced from it. The amount of caffeine and the taste and aroma of the coffee are good, and would be worth cultivating in the French Congo.—On the secreting apparatus of Dipterocarpus: P. Guérin.—On the effect of low temperatures on the zoospores of the Algae: E. C. Teodoresco. The spores of *Dunaliella salina* were found to retain their activity in a salt solution even after exposure to a temperature of -30°C .—On a new cellular type with metamorphosed cytoplasm, *Taenycystis mira*: Louis Léger.—Geographical variations of the Pleuronectidae: A. Cligny.—The extension of the functional states of the auricle to the ventricle: H. Kronecker. The author's experiments lead him to regard this effect as being entirely due to nervous elements.—Variations in morbid processes according to the composition of the organs: MM. Charrin and Le Play. Hydrolysis of the hepatic glycogen produced by the injection of amylase into the portal vein: M. Pariset.—On the stimulation of the nerves by very short electric waves: Louis Lapicque.—The experimental reproduction of leprosy in the ape: Charles Nicolle.—The geology of the Pyrenees of Haute-Garonne and Ariège: Léon Bertrand.—On the Amana meteorites: G. D. Hinrichs.—The cave lions: Marcellin Boule.

DIARY OF SOCIETIES.

THURSDAY, MARCH 2.

ROYAL SOCIETY, at 4.30.—Further Researches on the Temperature Classification of Stars. No. 2: Sir Norman Lockyer, K.C.B., F.R.S.—On the Radio-active Minerals: Hon. R. J. Strutt.—Atmospheric Electricity in High Latitudes: G. C. Simpson.—On the Spectrum of Silicon, with a Note on the Spectrum of Fluorine: J. Lunt.—On the Electric Resistance to the Motion of a Charged Sphere in Free Space or in a Field of Force: G. W. Walker.

ROYAL INSTITUTION, at 5.—Recent Astronomical Progress: Prof. H. H. Turner, F.R.S.

CHEMICAL SOCIETY, at 8.—The Latent Heat of Evaporation of Benzene and some other Compounds: J. Campbell Brown.—The Relation between Natural and Synthetic Glycerophosphoric Acids: F. B. Power and F. Tutin.—The Reduction of Isophthalic Acid: W. H. Perkin, jun., and S. S. Pickles.—The Transmutation of Geometrical Isomers: A. W. Stewart.

RÖNTGEN SOCIETY, at 8.15.—A discussion on "The Necessity of Accurate Measurement in X-ray and High Frequency Work," opened by Dr. W. D. Butcher.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, at 8.—Engineering Expert Evidence: J. F. Reade.

LINNEAN SOCIETY, at 8.—Zoological Nomenclature; International Rules and Others (to be followed by a discussion): Rev. T. R. R. Stebbing, F.R.S.—Biscayan Plankton. Part IV. The Thaliacea: Dr. G. Herbert Fowler.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Type-setting by Telegraph: D. Murray.

FRIDAY, MARCH 3.

ROYAL INSTITUTION, at 9.—Recent Advances in Wireless Telegraphy: Chev. G. Marconi.

GEOLGISTS' ASSOCIATION, at 8.—The Diamond Mines of South Africa: Prof. H. A. Miers, F.R.S.

SATURDAY, MARCH 4.

ROYAL INSTITUTION, at 3.—Archaeology: D. G. Hogarth.

MONDAY, MARCH 6.

SOCIETY OF ARTS, at 8.—Internal Combustion Engines: Dugald Clerk.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—Mechanics of Fire: Prof. H. E. Armstrong, F.R.S.—On the Estimation of Arsenic in Fuels—A Shortened Method: Dr. G. McGowan and R. B. Floris.

VICTORIA INSTITUTE, at 4.30.—Geological Exterminations: Dr. C. B. Waring.

FARADAY SOCIETY, at 7.50.—Annual general meeting.—At 8.15.—Recent Developments in Electric Smelting in Connection with Iron and Steel: F. W. Harbord.

TUESDAY, MARCH 7.

ROYAL INSTITUTION, at 5.—Some Recent Biometric Studies: Prof. K. Pearson, F.R.S.

ZOOLOGICAL SOCIETY, at 8.30.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Surface-Condensing Plants, and the Value of the Vacuum produced: R. W. Allen. (*Continuation of Discussion.*)

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WEDNESDAY, MARCH 8.

GEOLOGICAL SOCIETY, at 8.—(1) Observations on some of the Loxonematidae, with Descriptions of two New Species: (2) On some Gasteropoda from the Silurian Rocks of Llangadock: Miss Jane Donald.

SOCIETY OF ARTS, at 8.—Ethics of Japanese Society: Baron Suyematsu.

THURSDAY, MARCH 9.

ROYAL SOCIETY, at 4.30.—*Probable Papers:* The Rate of Transmission of the Guatemala Earthquake of April 19, 1902: R. D. Oldham.—Ionic Sizes in Relation to the Conductivity of Electrolytes: W. R. Bousfield.—Explosions of Mixtures of Coal Gas and Air in a Closed Vessel: L. Bairstow and A. D. Alexander.

ROYAL INSTITUTION, at 5.—Recent Astronomical Progress: Prof. H. H. Turner, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Report on Experiments carried out at the National Physical Laboratory: On the Effect of Heat on the Electrical and Mechanical Properties of Dielectrics, and on the Temperature Distribution in the Interior of Field Coils: Dr. R. T. Glazebrook, F.R.S.—On Temperature Curves and the Rating of Electrical Machinery: R. Goldschmidt.

FRIDAY, MARCH 10.

ROYAL INSTITUTION, at 9.—The Structure of the Atom: Prof. J. J. Thomson, F.R.S.

ROYAL ASTRONOMICAL SOCIETY, at 5.

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